





# WW Engineering & Science

A Summit Company

March 18, 1993

Mr. Ken Theison On-Scene Coordinator U.S. EPA, Region V 77 W. Jackson Boulevard HSE-5J Chicago, Illinois 60604

RE: SELMER SITE, ELKHART, INDIANA--REVISIONS TO WORK PLAN

Dear Ken:

Attached are two sets of revised pages 13 through 22 and Table 1 of WW Engineering & Science's (WWES) work plan for the Selmer site in Elkhart, Indiana.

These revisions are consistent with those we discussed and are documented in Elizabeth Murphy's February 25, 1993 correspondence to Linda Bullen and Michael Steinberg. I also have discussed the changes in sample methodology with Doug Yestis (U.S. EPA) to be sure we properly addressed his concerns.

We are confident that these revisions will address all the concerns of the U.S. EPA and look forward to a rapid approval of the technical content of this work plan.

If you have any questions, please contact me to discuss them at (616) 942-9600.

Sincerely,

WW ENGINEERING & SCIENCE

**Environmental Services** 

Scott T. Dennis, C.P.G.

Senior Hydrogeologist

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**REFERENCES** 

## 4.0 PHASE II - DRILLING AND SAMPLING PROGRAM

The soil and ground water conditions at the Site will be evaluated during a Phase II investigation. The second phase would include the implementation of a drilling and sampling program. The purpose of the drilling and sampling program is to assess the potential impact of VOCs to the soil and ground water at the Site and to determine the potential source(s) of the impacts. The objectives of the Phase II investigation are to:

- characterize the soil stratigraphy;
- quantify VOCs which may be present in the soil and ground water; and
- evaluate the distribution of the VOCs.

The scope of the proposed Phase II work will include:

- drilling of soil borings;
- · collection of soil samples during drilling;
- installation of temporary wells in the soil borings;
- measurement of water levels and collection of ground water samples from temporary wells;
- preparation of well/boring log sheets;
- laboratory analysis of soil and ground water samples for U.S. EPA Method 8021;
- preparation of maps and cross-sections;
- preparation of isochemical contour maps, if appropriate;
- identification of the absence or presence of VOC's in ground water at the Site; and
- identification of the absence or presence of potential source area(s).

The scope of work for the Phase II investigation including laboratory testing will be implemented by WWES' personnel in Grand Rapids, Michigan. Soil and ground water samples will be analyzed by WWES' Environmental Laboratory in Grand Rapids, Michigan.

## 4.1 FIELD METHODS

The following is a summary of the field methodology to be implemented during the Phase II investigation. For a more detailed description of Environmental Laboratory Division protocol, refer to WWES's SOP's in Appendix C. The field work will be implemented in accordance to the Health & Safety Plan presented in Appendix B.

## 4.1.1 SOIL BORINGS

If no anomalies indicative of potential source areas are observed during Phase I, five soil borings will be drilled using 4.25-inch inner diameter (ID) hollow-stem augers and an all-terrain vehicle (ATV) drill rig. The approximate locations of these soil borings are presented in Figure 5. The exact location of the soil boring within each area indicated in Figure 5 will be based on site accessibility. The soil boring locations were determined by Scott Dennis (WWES) and Ken Theisen (U.S. EPA) on October 6, 1992 during a visit to the site.

If anomalies indicative of potential source areas are observed during Phase I, appropriate soil boring locations will be presented in the Phase I technical memorandum. The drilling and sampling methodologies and depths will be similar to those described below.

The soil borings will be drilled to a depth of 5 feet below the ground water table. The soil boring locations will be labeled with the prefix "SB". Soil samples will be collected using a 1.5-inch ID split-spoon sampling device, 2 feet in length equipped with brass liners. The split-spoon sampling device and liner will be driven into undisturbed sediments ahead of the lead auger. Upon removal of the brass liner from the split-spoon sampling device, the ends will be immediately sealed with Teflon caps. The liner will remain sealed until the time of sample preparation at the analytical laboratory.

Soil samples will be collected in 2-foot intervals continuously in accordance with ASTM Method D-1586. Upon completion of the soil borings, the boreholes will be backfilled with natural soil cuttings. Decontamination of the hollow-stem augers, split-spoon sampling device, and brass liners is discussed in Section 4.3.2.

## 4.1.2 SOIL SAMPLING

Two sets of soil samples will be collected from each sample interval. One set will be collected and sealed in six-inch-long brass liners for laboratory testing. This set of soil samples will be labeled with the soil boring identification followed by sample depth in parenthesis. A duplicate set of soil samples will be collected once every ten sample intervals. This sample set will be labeled with the soil boring identification and the sample depth in parenthesis followed by the notation "Duplicate." All samples collected for chemical testing will be immediately sealed at the time of collection and placed in an iced cooler chest for transport to the laboratory. The second set of soil will be removed from the brass liners and placed in a mason jar for field screening and visual inspection.

One equipment rinse blank for every ten samples will also be submitted for laboratory testing (see Section 4.3.3). The "split-spoon rinse blank" label will contain the identification of the soil sample collected after decontamination of the split-spoon sampler. Table 1 presents the required containers, preservation techniques, and holding times for the soil (non-aqueous) samples collected for laboratory analysis.

#### 4.1.3 FIELD SCREENING

Field screening of soil samples will be performed using a photoionization detector (PID) using a 11.7 eV lamp. The PID measures the total amount of volatile organics in the headspace of a sample in parts per million (ppm) with of precision of 0.1 ppm. The method of measuring the headspace of a soil sample is described in detail in Appendix C.

The field screening results will be recorded on well/boring log sheets along with a lithologic description of the sample and the number of blow counts required to advance the split-spoon sampler.

#### 4.1.4 GROUND WATER SAMPLING

Ground water samples will be collected from temporary wells installed during drilling of each of the five soil borings. Temporary wells will be constructed consisting of 2-inch ID PVC riser pipe and a 10-foot long PVC well screen. The well materials will be placed within the bore hole once the augers have been advanced to a depth 7 feet below the water table. The augers will then be retracted to expose the well screen to the natural formation. The well screen will be set to intersect the water table.

The temporary wells will be developed until the discharge water is observed to be relatively free of suspended fines and until a minimum of three casing volumes of water are removed. After well development the well will be allowed to set for at least 48 hours prior to sampling. Prior to sampling, water level measurements will be recorded with an accuracy of 0.01 feet. Ground water samples will be collected for laboratory testing using a low-flow positive displacement sampling (Keck®) pump. At least three volumes of water will be removed from the well prior to sample collection using the sampling pump. One duplicate ground water sample and equipment rinse blank will be collected from one of the five wells.

The ground water samples will be labeled with the prefix "TW-" and the soil boring number followed in parenthesis by the well screen depth interval. The notation

"Duplicate" will be added to the sample identification for the duplicate ground water sample. The "equipment rinse blank" label will include the temporary monitoring well number which was sampled after decontamination of the positive displacement sampling pump. Table 1 presents the required containers, preservation techniques, and holding times for the ground water (aqueous) samples collected for laboratory analysis.

## **4.1.5 SURVEY**

The location of the soil borings will be referenced with respect to the grid established during the Phase I investigation. The soil boring locations will be recorded to the 1.0-foot accuracy and will be plotted on the map created for the Site.

The ground elevation at the soil boring locations will be recorded to the 0.10-foot accuracy and referenced to the Site benchmarks established during the Phase I investigation. The top-of-casing elevations of the temporary wells will be recorded with a 0.01-foot accuracy.

#### 4.2 LABORATORY TESTING

The following is a summary of the laboratory methodology to be implemented during the Phase II investigation. For a more detailed description of laboratory protocol, refer to Appendix E.

The scope of analytical testing during the Phase II investigation includes laboratory analysis of soil and ground water samples, including duplicate samples, equipment rinse blanks and trip blanks. The number and identification of the soil samples submitted for chemical testing will be based on the Phase I results, the Phase II field screening results, and the location, depth, and soil type of individual samples. All ground water samples collected during the Phase II site investigation will be analyzed.

The soil and ground water samples, duplicate samples, equipment rinse blanks, and trip blanks, will be analyzed for purgeable and halogenated VOCs by gas chromatography (GC) using U.S. EPA Method No. 8021. A compound list and associated detection limits for Method No. 8021 for non-aqueous and aqueous matrices is presented in Tables 2 and 3, respectively. A list of required sample volumes, containers, preservation methods, and holding times for aqueous and nonaqueous matrices is included in Table 1.

## 4.3 QA/QC PROGRAM

The QA/QC plan for the Phase II is based on WWES' standard laboratory protocol. The plan includes: (1) detailed field documentation; (2) decontamination of field equipment and proper sample handling; (3) laboratory analyses of equipment rinse blanks and trip blanks; (4) proper sample handling and shipment; (5) stringent laboratory QA/QC procedures; and (6) the collection and laboratory analyses of duplicate samples.

#### 4.3.1 FIELD DOCUMENTATION

To facilitate accurate field records, various forms will be utilized by WWES field personnel to document routine procedures. Among these procedures, forms will be utilized for well/boring logs, sample identification tags, and chain of custody. Examples of these forms are included in Appendix D.

Logbooks will be used to record the data collection activities performed in the field. Entries in the field logbook will be described in as much detail as possible so that persons returning to the Site may reconstruct a particular situation without reliance upon memory. A guideline for taking field notes and records is presented in Appendix C.

Each entry in the logbook will be associated with a project-specific document number. All entries will be made in ink and no erasures will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark, initialed and dated.

The title page of each logbook will contain the following:

- person to whom the logbook is assigned;
- logbook number;
- project name;
- project start and end dates.

Entries into the logbook will contain a variety of information. At the beginning of each entry, the date, start time, weather, names of all sampling team members present, level of personal protection being used, and the signature of the person making the entry will be entered. The names of visitors, field sampling, or investigation team personnel and the purpose of their visit will also be recorded in the field logbook.

Whenever a sample is collected, or a measurement is made, a detailed description of the location of the station shall be recorded. The equipment used to collect samples will be listed, along with the time of sampling and the volume and number of containers collected

for each sample interval. A sample identification number will be assigned prior to sample collection. The number of photographs taken of the station, if any, will be listed. All equipment used to make measurements will also be identified, along with the date of calibration. Any deviations to the proposed field activities will also be noted in the logbook. A guideline for taking field notes and records is in Appendix C.

## 4.3.2 DECONTAMINATION OF FIELD EQUIPMENT AND SAMPLE HANDLING

All field equipment used during sample collection will be decontaminated prior to each use to reduce the likelihood of cross-contamination of soil and ground water samples. The drilling equipment will be steam cleaned or detergent scrubbed with a non-phosphate soap and rinsed with deionized water prior to use at each soil boring location. The soil sampling equipment (split-spoon sampler, liner, and stainless-steel spatula) and ground water sampling equipment (well materials and sampling pump) will be steam-cleaned or washed with a non-phosphate soap and rinsed with deionized water prior to each sample interval.

Quality control provisions for soil and ground water sampling are as follows:

- The procedure for split-spoon sampling will consist of the method described in ASTM D 1586 found in Appendix C.
- Soil samples for volatile organic analyses will be collected using brass liner and Teflon caps to minimize the loss of volatile organic hydrocompounds.
- Soil samples will be collected in a jar for field screening with a PID or FID. These soil samples will be screened according to the technique described in the SOP entitled Jar Headspace Measurements in Unsaturated Soil Samples (Appendix C).
- Soil identification procedures will conform to WWES' standard soil classification found in Appendix C.
- Temporary well materials will be steam-cleaned prior to installation at each soil boring location.
- Ground water samples will be collected with a positive displacement sampling pump at each temporary well location.
- The ground water samples will be collected with no headspace to minimize the loss of volatile organic hydrocarbons.

## 4.3.3 DUPLICATE SAMPLES, EQUIPMENT BLANKS, AND TRIP BLANKS

Duplicate samples, equipment blanks, and trip blanks obtained will be analyzed during the Phase II investigation for VOCs (U.S. EPA Method No. 8021) to assess the quality of data resulting from the field sampling program.

Field duplicate soil and ground water samples will be collected and analyzed to check for sampling and analytical reproducibility.

Field equipment blanks will be collected to check for procedural contamination which may cause sample contamination. The general level of QC effort will be one equipment blank for every ten soil and ground water samples. The method of collection includes rinsing the split-spoon sampler and sampling pump with laboratory-grade deionized water and collecting the water in a 40 mL Teflon-lined vial with no headspace.

Field trip blanks will be used to assess the potential for contamination of samples due to contamination migration during sample shipment and storage. Soil and ground water samples will be shipped in separate coolers. One trip blank consisting of laboratory-grade deionized water will be poured into 40 mL Teflon-lined vials with no headspace at the laboratory and included along with each cooler of samples. The trip blank will remain in the cooler during shipment from the laboratory to the Site, while it is stored at the Site (if necessary), and during shipment back to the laboratory. The trip blank will only be removed from the cooler for labeling.

#### 4.3.4 SAMPLE SHIPMENT

The sample shipment procedures summarized below will insure that the samples were collected properly and have arrived at the laboratory with the chain-of-custody intact. Examples of chain-of-custody forms, and other field and sampling activity forms are located in Appendix D.

Preservation techniques will be used to retard the chemical and biological changes that may take place after a sample is taken from its parent source. Samples collected in this sampling program will be placed in coolers and cooled with ice immediately upon collection and then transported to the WWES' Environmental Laboratory where they will be stored at 4°C until analysis. Table 1 lists sample preservation, holding time, and volume requirements for each type of sample collected during this phase of work.

The sample labeling and shipping procedures listed below will be implemented during the Phase II investigation.

- The field technician will be responsible for the care and custody of the samples until
  they are transferred or properly dispatched. As few people as possible will handle the
  samples.
- All bottles will be tagged with sample numbers and locations. An example of a sample tag is located in Appendix D.
- Sample tags will be completed for each sample using waterproof ink unless prohibited by weather conditions.
- A sample cooler(s) will be dedicated to the transport of each type of sample matrix.
- Samples will be properly packaged for shipment and dispatched to the WWES'
  Environmental Laboratory for analysis, with a separate signed chain-of-custody
  record enclosed in each sample box or cooler identifying the contents. The original
  chain-of-custody record will accompany the shipment, and a copy will be retained by
  the sampler and returned to the WWES project manager.
- When transferring the possession of the samples, the individuals relinquishing and receiving the samples will sign, date, and note the time on the chain-of-custody record. This record documents transfer of custody of samples from the sampler to another person, to the analytical laboratory, or to/from a secure storage area. The chain-of-custody procedures for the WWES Environmental Laboratory are described in their Quality Assurance/Quality Control Procedures Manual (Appendix E).
- If the samples are sent by common carrier, a bill of lading shall be used. Receipts of bills of lading will be retained as part of the permanent documentation. If sent by mail, the package will be registered with return receipt requested. Commercial carriers are not required to sign off on the custody form as long as the custody forms are sealed inside the sample cooler.

## 4.3.5 LABORATORY QA/QC

All soil and ground water samples collected during field sampling activities at the Site will be analyzed by WWES' Environmental Laboratory in Grand Rapids, Michigan. The QA/QC Procedures Manual for the laboratory is presented in Appendix E.

Standard operating procedures for laboratory analyses are based on an analytical methods published by the U.S. EPA. For this project, U.S. EPA Method 8021 will be used. The standard operating procedure for this method, presented in Appendix F, specifies:

- procedures for sample preparation;
- instrument start up and performance check;
- initial and continuing calibration check requirements;
- specific methods for each sample matrix type; and
- · required analysis procedures.

Calibration of laboratory equipment will be based on approved written procedures (see Appendix E). Records of calibration, repairs, or replacement will be filed and maintained by the designated laboratory analyst. These records will be filed at the location where the work is performed and will be subject to QA audit.

## 4.4 REPORT

Upon completion of the drilling and sampling program, a report will be prepared by WWES summarizing the results of the soil gas survey and drilling and sampling programs, if no further investigatory work is warranted. The data will be presented in tabular and graphic format. Isochemical contour maps and cross sections will be prepared, if appropriate. The lateral and vertical extent of VOCs in the soil, if present, will be delineated. Identification of potential source areas will be made, if possible. Based on the results of the Phase I and II investigations, recommendations will be made regarding any appropriate remedial action.

A technical memorandum will be prepared in lieu of the report if soil or ground water is determined to be impacted and additional characterization of the contaminated ground water or contaminated soil is needed. The technical memorandum will include a proposed scope of work for the third phase of field investigation.

The report or technical memorandum will be submitted to the U.S. EPA for their review and comment.

## TABLE 1

# U.S. EPA METHOD 8021 REQUIRED SAMPLE VOLUMES, CONTAINERS, PRESERVATION METHODS AND HOLDING TIMES FOR AQUEOUS AND NON-AQUEOUS MEDIA

# SELMER COMPANY ELKHART, INDIANA

MATRIX	CONTAINER	PRESERVATION	HOLDING TIME
Non-Aqueous	sealed brass liners	cool 4°C; HCL	14 days
Aqueous	2-40 mL glass vials	cool 4°C; HCL	14 days